WHAT IS CLAIMED IS:

1. A method for fabricating a multi-layer electroplating mask for the formation of a submicrometer structure, the multi-layer electroplating mask including a substrate, a seedlayer deposited on said substrate, a first photoresist layer deposited on said seedlayer, a hard mask layer deposited on said first photoresist layer, and a second photoresist layer deposited on said hard mask layer, said first photoresist layer being thicker than said second photoresist layer, comprising:

performing a photoresist etch of said first photoresist layer to define a trench having vertical sidewalls; and

after said photoresist etch, performing a silylation of said trench for a predetermined period of time to narrow said trench in width.

2. The method according to claim 1, wherein said photoresist etch comprises a reactive ion etching process.

3. The method according to claim 1, wherein said photoresist etch comprises an inductively coupled plasma etching process.

4. The method according to claim 1, further comprising:

prior to said photoresist etch, lithographically patterning said second photoresist layer with an exposure;

developing the second photoresist layer; and

etching said hard mask layer.

5. An electroplating mask formed by the process of claim 1.

6. The electroplating mask according to claim 5 having a trench width of less than 0.3 micrometers.

7. A method for fabricating a multi-layer electroplating mask for the formation of a submicrometer magnetic structure, the multi-layer electroplating mask including a substrate, a seedlayer deposited on said substrate, and a photoresist layer deposited on said seedlayer, said photoresist layer having a thickness of about 4 micrometers to about 6 micrometers, comprising:

lithographically patterning said photoresist layer with an exposure to define a trench having vertical sidewalls; and

performing a silylation of said trench for a predetermined period of time to narrow said trench in width.

8. The method according to claim 7, further comprising:

prior to said silylation, developing said photoresist layer.

9. An electroplating mask formed by the process of claim 7.

10. The electroplating mask according to claim 9 having a trench width of less than 0.3 micrometers.

7 11. A method of fabricating a submicrometer structure from a multilayer electroplating mask structure that includes a substrate, a seedlayer deposited on said substrate, and a first photoresist layer deposited on said seed-layer, comprising:

lithographically patterning said photoresist layer with an exposure to define a trench having vertical sidewalls;

developing said photoresist layer;

performing a silylation of said trench to narrow said trench in width;

performing an electroplating process to form a submicrometer structure that is coupled to said seedlayer.

8 12. The method according to claim 7 11, wherein said formed structure has a width of less than 0.3 micrometers.

9 13. The method according to claim 7 11, further comprising:

removing excess photoresist from said mask after said electroplating.

10 14. The method according to claim 7 11, wherein said seedlayer comprises a metallo-magnetic material, and wherein said structure formed is a magnetic pole.

11 15. A method of fabricating a submicrometer structure from a multi-layer electroplating mask structure that includes a substrate, a seedlayer deposited on said substrate, a first photoresist layer deposited on said seedlayer, a hard mask layer deposited on said first photoresist layer, and a second photoresist layer deposited on

said hard mask layer, said first photoresist layer being thicker than said second photoresist layer, comprising:

performing a photoresist etch of said first photoresist layer to define a trench having vertical sidewalls;

after said photoresist etch, performing a silylation of said trench for a predetermined period of time to narrow said trench in width; and

performing an electroplating process to form a submicrometer structure that is coupled to said seedlayer.

16. The method according to claim 11, wherein said formed structure has a width of less than 0.3 micrometers.

17. The method according to claim 11, further comprising:

prior to said photoresist etch, lithographically patterning said second photoresist layer with an exposure;

developing the second photoresist layer; and

etching said hard mask layer.

18. The method according to claim 11, further comprising:

removing excess photoresist from said mask after said electroplating.

19. The method according to claim 11, wherein said multi-layer electroplating mask structure further includes a protective layer disposed in between said seed-layer and said first photoresist layer.

20. The method according to claim 15, wherein said seedlayer comprises a metallo-magnetic material, and wherein said structure formed is a magnetic pole.

21. A device used to fabricate an electroplating mask, comprising:

a hard mask etch chamber for performing a hard mask etch process on the electroplating mask;

a resist etch chamber for performing a resist etch process on the electroplating mask to define a trench having vertical sidewalls; and

a silylation chamber for performing a silylation process on the electroplating mask to narrow said trench in width.

22. The device according to claim 21, further comprising:

a transfer module housing a robotic system to transfer the electroplating mask between said hard mask etch, said resist etch, and said silylation chambers.

23. The device according to claim 22, further comprising:

a load lock module from which electroplating masks can be loaded into or unloaded from said transfer module.

24. The device according to claim 21, further comprising:

a control unit to control a time of said silylation process.